"PLASTIC" AMPUTATIONS OF THE FOOT.

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OF all the typical amputations of the lower extremity. those of Syme and Plrogoff give the best results, especially as regards the ultimate usefulness of the limb. In the latter respect, amputations through the middle and lower thirds of the leg have no advantage over amputations just below the knee-joint, and are indeed at a comparative disadvantage, for when the patient wears a "kneeling-leg," the long stump sticks out behind and in the way.

I have already shown how a kind of Syme may be performed for the cure of ulcer of the leg, the skin and other soft tissues of the sole and sides of the foot being preserved and utilized to cover the site of the ulcer. (See ANNALS OF SURGERY. vol. vi. p. 100).

The following case demonstrates *the practicability of doing an amputation through the ankle-joint as good as a Syme even when the heel is destroyed.*

Edward O'Neil, æt. 11, schoolboy, admitted in the West London Hospital, Feb. 28, 1888, his foot having been lacerated and crushed by the wheel of a wagon passing over it. The skin and subjacent soft tissues of the heel and great part of the sole and sides of the foot were torn away from the ankle downward, and hung down. A narrow anterior bridge of skin united the skin of the leg with the skin on the dorsum of the foot. The skin, fat and and other superficial tissues were detached from the muscles, etc., of the sole as far forward as even beyond the bases of the metatarsal bones. The posterior tibial artery could be felt beating, but not the anterior. Indeed the tendons and deep structures appeared to be more injured on the dorsal aspect of

the ankle than in the sole of the foot. Some of the extensor tendons were lacerated, and the joint between the astragalus and scaphoid opened on the dorsal aspect. Hæmorrhage was considerable. A consultation having been held, it was decided to give the skin of the heel a chance to live.

The foot having been cleansed, a small drainage tube was passed beneath the bridge of skin left intact so that it rested on the open Chopart's joint. Another was passed from just internal to the Achillès' tendon downward through an incision in the heel, and then the flap torn forward was pulled back over the heel into its proper place, all tension being carefully avoided.

No vessels required tying. Oozing was arrested by hot weak carbolic lotion poured gently over the surfaces.

Large antiseptic dressings, iodoform gauze next the wound, then sublimate packing, and, over all, a great deal of salicylic wool. The foot was swung high with an anterior splint on the leg, ankle and foot.

Partly owing to a tendency to bleed and partly on account of pain and discharge, the dressings had to be changed daily. On the third day it was evident that the heel skin would not live.

The gangrene spread till March 4 (sixth day), when the slough separated, the entire heel and a great part of the sole formed a wound covered with exuberant granulations, very hæmorrhagic and discharging freely. The evening temperature from the 10th to the 21st of March varied between 99° and 100°, once reaching 101°; but the boy's general condition was not good or improving. The epiphysis of the os calcis had necrosed. Sleeplessness and constant pain.

The nature and extent of the injuries, and especially *the destruction of the anterior tibial artery maae an osteoplastic resection of the Miculicz-Wladimiroff variety impossible.*

The following resection was performed: Esmarch's bandage having been applied, a longitudinal incision was made from above the upper border of the os calcis down to the base of the fifth metatarsal bone, curving down over the heel and sole of the foot, *i. e.*, not running along its outer side. The Achillès tendon being divided, the os calcis was seized with lion forceps and rotated in different directions as its attachments were cut until it came away. The astragalus was similarly dealt with. The cuboid, scaphoid and external and middle cuneiform bones were removed in a mass through the same incision. The internal cuneiform was extracted conveniently through an old wound lying immediately over it.

The malleoli and articular surfaces of the leg bones were sawn off, as were also the articular surfaces of the metatarsal bones.

All the granulations, (which formed a jelly like mass), were scraped away.

The metatarsal bones were wired with two lateral sutures to the tibia and fibula.

The deep structures of the sole and inner side of the foot formed a large bulging mass, of course uncovered. None were cut away except two or three tendons, including the tibialis posticus and peroneus longus. No drainage tubes were needed. When the Esmarch was removed, no bleeding followed, although the circulation was rapidly restored.

During the next few days the discharge was very profuse, there was a great tendency to hæmorrhage, not from any particular vessel, but rather from the granulations which were rapidly reforming. On one occasion the bleeding was very profuse. The temperature generally rose in the evening to 100°, and sometimes to 101°. And the pain complained of was very great.

The frequent dressings necessary were interfering seriously with the fixation of the part, and signs appeared that the wire sutures were cutting through the soft structures of the boy's metatarsal bones. It was obviously desirable to obtain a wound calculated to make less demands on the patient's powers of repair and endurance.

Accordingly, April 2, 34 days after the accident, and 12 days after the resection the following amputation was performed. (Considerable hæmorrhage had occurred early in the morning so that I found a tourniquet applied on arriving at the hospital at 10 A M).

Amputation.—The sole of the foot still remained sound for two or three inches posterior to the balls of the toes. This was cut away from the subjacent metatarsal bones and then remained connected to the limb only by the mass of soft tissues containing the internal and external plantar vessels and nerves. All this mass was cut away, except a bridge of flesh (uncovered it will be remembered by skin) narrow at the base behind the site of the inner malleolus and growing wider toward the piece of skin at its extremity. The fleshy bridge contained the plantar vessels and nerves.

The surface of the tibia and fibula was now refreshed, and *the skin, etc., which had been reflected from the anterior part of the sole of the foot behind the balls of the toes, placed upon the ends of these bones* so refreshed. Sutures fixed the margins of this skin flap to the skin of the ankle on three sides. On the fourth (or postero-internal) side its

"peduncle," so to call the bridge of tissues containing the plantar vessels and nerves, formed a rounded fleshy projection, of course not covered by skin. The end of the stump was, however, completely skin-covered, and the amputation was mistaken for an ordinary Syme by all to whom it was shown without explanation.

A small drainage tube was used. Esmarch's elastic tourniquet used. Operation practically bloodless.

FIG. 1. RESULT AFTER PLASTIC AMPUTATION OF THE FOOT.

April 3. (Day after operation). Much better, passed a good night, slept after 10 minims of laudanum. Has had scarcely any pain since the operation. Dressings not soiled. T. 98.8° in morning, 101.6° in evening.

April 4. Dressed. Little discharge, drainage tube removed. The temperature fluctuated slightly, though with a gradual tendency downward, and did not remain steadily normal till nearly five weeks after the amputation.

The principal notes for the next three weeks refer to a rather large

lacerated wound which the patient had received at the time of the accident, toward the back and one side of the leg just below the knee and also to a small superficial abscess which formed in the right sacro-gluteal region," but was speedily cured. The amputation stump was dressed on the 3rd, 11th, 17th, 22nd, and 24th day of the operation. Boracic lint soaked in red lotion was used at the third dressing. Grafts were afterward implanted occasionally, and the lump of uncovered flesh formed by the peduncle of the flap was cicatrized over at the beginning of August. This was four months after the amputation, but need not have been so long had skin grafting been resorted to earlier than it was. The "peduncular prominence" had shrunk in size very remarkably. The stump is quite shapely, and firm pressure can be borne on the end of it. The patient's general condition is admirable. The wound behind the knee is not quite healed, and shows a tendency to cause some contraction at that joint.

I do not advocate this amputation as a universal substitute for osteoplastic resection. I rather bring it forward as *a type of a mode of combining a plastic operation with amputation* in such a manner as to enable amputation to be performed at a much lower level in a given case, and at the same time to produce a superior stump.

The annexed illustration from a photograph by Mr. Sidney Bontor, displays the stump to the best advantage, but conceals the lump which, on the inner and posterior aspect, constitutes the remains of the bridge of tissue containing the plantar arteries and nerves. Dr. Percy Lush recorded the notes of the case.